IN THE CLAIMS:

Please cancel claims 2-3 and 7 without prejudice and amend the claims as follows:

1. (Currently Amended) An apparatus for determining a propagation time delay, comprising:

at least one source adapted to generate a plurality of positioning signals;

at least one receiver deployed along a seismic sensing cable, wherein the receiver is adapted to receive the plurality of positioning signals from the at least one source;

a library comprising a plurality of sets of ~~a plurality of~~ computed Doppler-shifted positioning signals, each set corresponding to one of the plurality of positioning signals; and

a signal processing unit adapted to determine a propagation time delay between the source and the receiver using the generated positioning signals, the received positioning signals, and the plurality of computed Doppler shifted positioning signals.

2-3. (Cancelled)

4. (Currently Amended) The apparatus of claim [[3]]1, wherein each computed Doppler-shifted positioning signal in each of the plurality of sets comprises a computed Doppler-shifted positioning signal indicative of one of a plurality of velocities.

5. (Currently Amended) An apparatus for determining a propagation time delay, comprising:

at least one source adapted to generate a plurality of positioning signals;

at least one receiver deployed along a seismic sensing cable, wherein the receiver is adapted to receive the plurality of positioning signals from the at least one source;

a library having a plurality of sets of computed Doppler-shifted positioning signals corresponding to the plurality of positioning signals, wherein each set corresponds to one of the plurality of positioning signals, wherein each computed Doppler-shifted positioning signal in each set is indicative of one of a plurality of velocities ~~The apparatus of claim 4~~, wherein the plurality of velocities comprises a range of velocities having a velocity resolution; and

a signal processing unit adapted to determine a propagation time delay between the source and the receiver using the generated positioning signals, the received positioning signals, and the plurality of computed Doppler shifted positioning signals.

6. (Currently Amended) An apparatus for determining a propagation time delay, comprising:

at least one source adapted to generate a plurality of positioning signals;

at least one receiver deployed along a seismic sensing cable, wherein the receiver is adapted to receive the plurality of positioning signals from the at least one source;

a plurality of computed Doppler-shifted positioning signals corresponding to the plurality of positioning signals;

a signal processing unit adapted to determine a propagation time delay between the source and the receiver using the generated positioning signals, the received positioning signals, and the plurality of computed Doppler shifted positioning signals; and

~~The apparatus of claim 1, further comprising~~ at least one first velocity meter coupled to the at least one source, wherein the plurality of computed Doppler-shifted positioning signals are generated using the first velocity meter.

7. (Cancelled)

8. (Currently Amended) An apparatus for determining a propagation time delay, comprising:

at least one source adapted to generate a plurality of positioning signals having

~~The apparatus of claim 1, wherein the plurality of positioning signals comprises~~ a plurality of sequences;

at least one receiver deployed along a seismic sensing cable, wherein the receiver is adapted to receive the plurality of positioning signals from the at least one source;

a plurality of computed Doppler-shifted positioning signals corresponding to the plurality of positioning signals; and

a signal processing unit adapted to determine a propagation time delay between the source and the receiver using the generated positioning signals, the received positioning signals, and the plurality of computed Doppler shifted positioning signals.

9. (Original) The apparatus of claim 8, wherein the plurality of sequences comprises a plurality of separable sequences.

10. (Currently Amended) The ~~method~~ apparatus of claim 9, wherein the plurality of separable sequences comprises a plurality of substantially orthogonal sequences.

11. (Currently Amended) The ~~method~~ apparatus of claim 10, wherein the plurality of substantially orthogonal sequences comprises at least one of a plurality of Kasami sequences and a plurality of Maximal sequences.

12. (Currently Amended) An apparatus for determining a propagation time delay, comprising:

at least one source adapted to generate a plurality of positioning signals;

at least one receiver deployed along a seismic sensing cable, wherein the receiver is adapted to receive the plurality of positioning signals from the at least one source;

a plurality of computed Doppler-shifted positioning signals corresponding to the plurality of positioning signals; and

a signal processing unit adapted to determine a propagation time delay between

the source and the receiver using the generated positioning signals, the received positioning signals, and the plurality of computed Doppler shifted positioning signals ~~The apparatus of claim 1~~, wherein the signal processing unit is adapted to determine the propagation time delay by cross-correlating the generated positioning signal and the received positioning signal.

13. (Currently Amended) An apparatus for determining a propagation time delay, comprising:

at least one source adapted to generate a plurality of positioning signals;

at least one receiver deployed along a seismic sensing cable, wherein the receiver is adapted to receive the plurality of positioning signals from the at least one source;

a plurality of computed Doppler-shifted positioning signals corresponding to the plurality of positioning signals; and

a signal processing unit adapted to determine a propagation time delay between the source and the receiver using the generated positioning signals, the received positioning signals, and the plurality of computed Doppler shifted positioning signals ~~The apparatus of claim 1~~, wherein the signal processing unit is adapted to determine the propagation time delay by cross-correlating the received positioning signal with at least one computed Doppler-shifted positioning signal.

14. (Currently Amended) A method for determining a propagation time delay, comprising:

generating at least one positioning signal using at least one source;

receiving the at least one positioning signal with at least one receiver positioned along a seismic cable;

determining at least one velocity;

determining ~~providing~~ at least one computed Doppler-shifted positioning signal using ~~corresponding to~~ the at least one positioning signal and the at least one velocity; and

determining at least one propagation time delay from the source to the receiver

using the generated positioning signal, the received positioning signal, and the at least one computed Doppler-shifted positioning signal.

15. (Original) The method of claim 14, wherein determining the at least one propagation time delay comprises cross-correlating the generated positioning signal and the received positioning signal.

16. (Original) The method of claim 14, wherein determining the at least one propagation time delay comprises cross-correlating the received positioning signal with the at least one computed Doppler-shifted positioning signal.

17. (Currently Amended)The method of claim 14, wherein determining ~~providing~~ the at least one computed Doppler-shifted positioning signal comprises:

~~determining at least one velocity;~~

~~determining the at least one computed Doppler-shifted positioning signal using the at least one generated positioning signal and the at least one velocity;~~

forming a library using the at least one computed Doppler-shifted positioning signal; and

accessing the library.

18. (Original) The method of claim 17, wherein forming the library comprises providing an index to the at least one computed Doppler-shifted positioning signal.

19. (Currently Amended) A method for determining a propagation time delay, comprising:

generating at least one positioning signal using at least one source;

~~The method of claim 14, further comprising~~ coupling a first velocity meter to the source;

receiving the at least one positioning signal with at least one receiver positioned along a seismic cable;

providing at least one computed Doppler-shifted positioning signal

corresponding to the at least one positioning signal; and

determining at least one propagation time delay from the source to the receiver using the generated positioning signal, the received positioning signal, and the at least one computed Doppler-shifted positioning signal.

20. (Original) The method of claim 19, wherein providing the at least one computed Doppler-shifted positioning signal comprises:

determining at least one velocity using the first velocity meter; and

determining the at least one computed Doppler-shifted positioning signal for the at least one positioning signal using the at least one velocity.

21. (Currently Amended) The method of claim [[14]]19, further comprising coupling a second velocity meter to the at least one receiver.

22. (Original) The method of claim 21, wherein providing the at least one computed Doppler-shifted positioning signal comprises:

determining at least one velocity using the second velocity meter; and

determining the at least one computed Doppler-shifted positioning signal for the at least one positioning signal using the at least one velocity.

23. (Original) The method of claim 14, wherein generating the at least one positioning signal comprises generating at least one sequence, receiving the at least one positioning signal comprises receiving at least one sequence, providing the at least one computed Doppler-shifted positioning signal corresponding to the at least one positioning signal comprises providing at least one computed Doppler-shifted sequence corresponding to the at least one sequence, and determining the at least one propagation time delay from the source to the receiver using the generated positioning signal, the received positioning signal, and the at least one computed Doppler-shifted positioning signal comprises determining the at least one propagation time delay from the source to the receiver using the generated sequence, the received sequence, and the at least one computed Doppler-shifted sequence

24. (Original) A method for forming a library, comprising:

determining a plurality of velocities;

selecting a plurality of positioning signals;

determining a plurality of computed Doppler-shifted positioning signals for each of the plurality of positioning signals using the plurality of velocities; and

providing an index to the plurality of computed Doppler-shifted positioning signals.

25. (Currently Amended) A method for forming a library, comprising:

determining a plurality of velocities ~~The method of claim 24~~, wherein determining the plurality of velocities comprises selecting a velocity range;

selecting a plurality of positioning signals;

determining a plurality of computed Doppler-shifted positioning signals for each of the plurality of positioning signals using the plurality of velocities; and

providing an index to the plurality of computed Doppler-shifted positioning signals.

26. (Original) The method of claim 25, wherein selecting the velocity range comprises selecting the velocity range extending from about 4 meters/second to about -4 meters/second.

27. (Currently Amended) A method for forming a library, comprising:

determining a plurality of velocities~~The method of claim 24~~, wherein determining the plurality of velocities comprises selecting a velocity resolution;

selecting a plurality of positioning signals;

determining a plurality of computed Doppler-shifted positioning signals for each of the plurality of positioning signals using the plurality of velocities; and

providing an index to the plurality of computed Doppler-shifted positioning signals.

28. (Original) The method of claim 27, wherein selecting the velocity resolution comprises selecting the velocity resolution of 1 meter/second.

29. (Currently Amended) A method for forming a library, comprising:

determining a plurality of velocities;

selecting a plurality of positioning signals~~The method of claim 24~~, wherein selecting the plurality of positioning signals comprises selecting one positioning signal for each of a corresponding plurality of seismic sources and seismic receivers;

determining a plurality of computed Doppler-shifted positioning signals for each of the plurality of positioning signals using the plurality of velocities; and

providing an index to the plurality of computed Doppler-shifted positioning signals.

30. (Currently Amended) A method for forming a library, comprising:

determining a plurality of velocities;

selecting a plurality of positioning signals ~~The method of claim 24~~, wherein selecting the plurality of positioning signals comprises selecting a plurality of sequences;

determining a plurality of computed Doppler-shifted positioning signals for each of the plurality of positioning signals using the plurality of velocities; and

providing an index to the plurality of computed Doppler-shifted positioning signals.

31. (Original) The method of claim 30, wherein selecting the plurality of sequences comprise selecting a plurality of separable sequences.

32. (Original) The method of claim 31, wherein selecting the plurality of separable sequences comprises selecting a plurality of substantially orthogonal sequences.

33. (Original) The method of claim 32, wherein selecting the plurality of substantially orthogonal sequences comprises selecting at least one of a plurality of

Kasami sequences and a plurality of Maximal sequences.

34. (Original) The method of claim 30, wherein determining the plurality of computed Doppler-shifted positioning signals comprises determining a plurality of computed Doppler-shifted sequences.

35. (Original) The method of claim 34, wherein determining the plurality of computed Doppler-shifted sequences comprises determining a plurality of binary computed Doppler-shifted sequences.

36. (Original) The method of claim 35, wherein determining the plurality of binary computed Doppler-shifted sequences comprises determining the plurality of binary computed Doppler-shifted sequences using a threshold.

37. (Original) The method of claim 36, wherein determining the plurality of binary computed Doppler-shifted sequences using the threshold comprises transforming a value of the computed Doppler-shifted sequence to + 1 or -1 using the threshold.

38. (Original) The method of claim 24, further comprising storing the library.

39. (Original) A library comprising a data structure encoded on a computer-readable storage medium, wherein the library comprises:

a plurality of computed Doppler-shifted positioning signals formed by:

determining a plurality of velocities;

selecting a plurality of positioning signals; and

determining the plurality of computed Doppler-shifted positioning signals for each of the plurality of positioning signals using the plurality of velocities; and

an index of the plurality of computed Doppler-shifted positioning signals.

40. (Currently Amended) A library comprising a data structure encoded on a computer-readable storage medium, wherein the library comprises:

a plurality of computed Doppler-shifted positioning signals formed by:

determining a plurality of velocities;

selecting a plurality of positioning signals~~The library of claim 39~~, wherein the positioning signals are sequences; and

determining the plurality of computed Doppler-shifted positioning signals for each of the plurality of positioning signals using the plurality of velocities; and

an index of the plurality of computed Doppler-shifted positioning signals.

41. (Original) The library of claim 40, wherein the sequences are orthogonal sequences.

42. (Original) The library of claim 41, wherein the orthogonal sequences are at least one of a Kasami sequence and a Maximal sequence.